REMARKS

This is in response to the Office Action mailed November 7, 2008, a response to which was due February 7, 2009. The response date has been extended to May 7, 2009, by paying appropriate government fees for a three month extension of time. Claims 1-17 are pending in the application; claims 12-17 are withdrawn from consideration; claims 1-11 were presented for consideration. After entry of this Amendment, claims 1-11 are pending for consideration. No new matter is added with this amendment. With regard to withdrawn claims 12-17, applicants request rejoinder of these claims when claims 1-11 are found allowable and will amend claim 12-17 to reflect the scope of the allowed claims, pursuant to the Examiner's explanation.

Applicants respectfully request the Examiner to enter this amendment and to consider this subject matter.

I. Claim Objections

According to the Examiner, Claim 11, lines 5-6, should read – and is then extruded and spun to give fibers--.

In response, Applicants have amended Claim 11, pursuant to the Examiner's suggestion.

II. Claim Rejections under 35 USC 102

Claims 1-2 stand rejected under 35 USC 102(b) as anticipated by Wood (WO 96/18493) ("Wood"). Claim 2 depends from claim 1 and, therefore, contains all the limitations of claim 1.

According to the Examiner, Wood inherently describes an infrared radiation falling exclusively between wavelengths of 0.75 μm and 0.80 μm. With regard to claim 2, the Examiner states that Wood teaches supplying heat to the polymer at page 3, lines 15-19. Applicants respectfully traverse this rejection.

In further response and without conceding that Wood inherently teaches what the Examiner says it does, applicants have amended claim 1 to further clarify the invention. Applicants have amended claim 1 to recite an electromagnetic radiation having a defined wavelength selected from the wavelengths in the range from 0.8 to 100 µm. That is, the present invention requires the practitioner of the invention to select a specific wavelength from a specific range of wavelengths. The application describes this at page 9, line 20 to page 10, line 18. Applicants explain that the precise wavelength selected will depend upon the polymer to be processed and other factors. They further state that the "wavelength most suitable for the method according to the invention can be determined for any polymer and any experimental arrangement by a few routine experiments" and mention using spectroscopic and quantum energy methods to determine the precise wavelength (page 9, lines 29-32). In contrast, Wood teaches using radiation with a broad range of wavelengths. It does not teach or suggest the use of radiation with a single or "defined" wavelength, as is recited in amended claim 1.

The thermoplastic deformation of the polymers in the method of the present invention does not occur by melting the polymer. Rather, electromagnetic radiation of a defined (*i.e.*, specific wavelength) is used, which exactly corresponds to the intramolecular covalent bond energies which keep the polymer molecules from moving. Therefore, the thermoplastic deforming of the claimed method is carried out at a temperature which is below the melting temperature by a non-thermic process. This is explained *e.g.* on page 8, lines 11-29, of the present application. This distinction is clarified by the amendment to claim 1, which now recites that the method is carried out at a temperature which is below the temperature at which the polymer melts.

In contrast, Wood teaches using infrared light to heat the polymer above the melting temperature, and thus, the infrared light is only used as a source to introduce heat into the polymer. This is not done by the electromagnetic radiation in the present invention. Rather, as explained above, by using electromagnetic radiation of a well-defined wavelength which corresponds to an energy which is exactly identical to the

bond energy of the intramolecular bond in the polymer, it is possible to break those intramolecular bonds at a temperature far below the melt temperature.

In view of the above amendment and explanations, applicants respectfully request the Examiner to reconsider and withdraw the rejection of claims 1 and 2 as being anticipated by Wood.

III. Claim Rejections under 35 USC 103

Claims 3-4 and 7-10 stand rejected under 35 USC 103(a) as being unpatentable over Wood (WO 96/18493, already of record) as applied to Claim 1 above and in view of Nordin *et al.* ("Note on molten cellulose produced in a laser beam" already of record) ("Nordin"). The Examiner's argument is that Wood teaches the general method of the invention except that it does not teach that the electromagnetic radiation is laser radiation that has a wavelength in the range from 1 to 50μm or that the polymer is a polysaccharide that can form intermolecular hydrogen bridge bonds, such as cellulose. The Examiner cites Nordin for teaching melting crystalline cellulose with a laser to avoid cross-linking and degradation reactions. The Examiner believes it would have been obvious to substitute the crystalline cellulose of Nordin for the meltable polymer of Wood. Applicants respectfully traverse this rejection.

In order to sustain a *prima facie* case of obviousness based upon a combination of prior art, the combination of references must teach all of the elements of the rejected claims. Without conceding that there would have been a motivation to combine the art as the Examiner has done, applicants argue that such combination would not arrive at the claimed invention. Claims 3-4 and 7 depend directly or indirectly from claim 1 and, therefore, incorporate all of the limitations of claim 1. Wood does not suggest the invention of amended claim 1 or the rejected claims that depend from amended claim 1, for reasons set forth above. Nordin discloses that cellulose melts at extremely high temperatures, and this melt temperature can only be estimated, as it is not possible to

measure it. The reason for this is that the estimated melting temperature is roughly about 450°C, while cellulose already decomposes at about 180°C. What Nordin suggests is heating the cellulose so fast to above the estimated melt temperature of 450°C that melting occurs before the degradation can occur. After the short heating, the cellulose must immediately be cooled to below the composition temperature. Thus, Nordin uses laser as a source of heat and uses a laser pulse to increase the temperature of the cellulose to above 450°C for a very short time before reducing the temperature again. During this very short time, Nordin assumes that a melt has been achieved. However, this is not the process of the present application, where the laser is not used to increase the heat of the polymer to above the melting temperature but rather to selectively break the intramolecular bonds. Accordingly, the process of the present application is carried out below the melting temperature of the polymer, preferably at least 20°C below the melting temperature of the polymer (*e.g.* present application, page 8, second full paragraph and page 15, first full paragraph). This has been made more clear in present claim 1 by the amendment to add that the method is carried out at a temperature which is below the temperature at which the polymer melts. This is a clear distinction from Woods and Nordin which both disclose standard temperature-depending melt processes which have nothing to do with the thermoplastic deforming of the claimed process.

For these reasons, one of skill in the art could not arrive at the invention by combining Woods with Nordin; thus, the Examiner's rejection must fail. Withdrawal of this rejection over a combination of Wood and Nordin is therefore respectfully requested.

With regard to claim 5, which recites specific pressures, the Examiner cites Wood and also states that this claim recites a mere optimization. With regard to claim 6, which recites specific shearing forces, the Examiner cites Wood as applied to claim 1, in combination with Gessner (US Patent No. 5,270,107). Gessner is said to disclose the recited shearing force range for deforming polymers. With regard to claim 11, which recites extruding and molding fibers, the Examiner cites Wood and Gessner.

Applicants traverse the Examiner's rejections of claims 5, 6 and 11 for the same reasons set forth above in connection with claim 1, from which the rejected claims depend. As a primary reference, Wood fails to disclose or suggest the selection of a defined, *i.e,* specific, wave length within a specific range of wave lengths of electromagnetic radiation and fails to teach or suggest a method that relies upon a temperature below the polymer's melting temperature. Because these features of claim 1 are not suggested by Wood or any of the other references, the Examiner's obviousness rejection of claims which incorporate these features, is insupportable. In view of the amendment to claim 1 and the above explanations, applicants respectfully request the Examiner to reconsider and withdraw the rejection of claims 5, 6 and 11.

CONCLUSION

In light of the above amendments and comments, Applicants respectfully request that all rejections and objections be withdrawn and that pending claims be allowed.

Should the Examiner believe that anything further is necessary in order to place this application in better condition for allowance, the Examiner is requested to contact the undersigned at the telephone number listed below.

In the event that additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefore are hereby authorized to be charged to our Deposit Account No. 01-2300 referencing docket number 029368-00035.

Respectfully submitted,

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